Claims

1. A storage media management apparatus to and from which a plurality of storage media are connected and disconnected, comprising:

5   a dividing unit operable to divide a content into a plurality of content parts, for storing the content as being divided into a plurality of storage media;

a management information generating unit operable to generate a plurality of pieces of management information in correspondence to the content parts, each piece of management
10   information including (a) reconstruction information for reconstructing the content by concatenating a corresponding content part with the other content parts, and (b) individual information for making the corresponding content part
15   individually usable;

a writing unit operable to write each content part together with a corresponding piece of management information, to a different one of the storage media; and

a reconstruction judging unit operable, when a content
20   part stored in one of the storage media is to be used, to judge whether the content is to be reconstructed and made usable, or the content parts are to be individually made usable, based on the piece of management information stored in each storage medium.

2. The storage media management apparatus of Claim 1,

further comprising:

a reading unit operable to read the pieces of management

information from storage media that have been connected; and

5   a program information generating unit operable to

generate, based on reconstruction information included in each

piece of management information read by the reading unit,

reconstruction program information for presenting the content

as one program, when the reconstruction judging unit judges

10   that the content is to be reconstructed and made usable.

3. The storage media management apparatus of Claim 2,

wherein

the reconstruction judging unit judges that the content

15   parts are to be individually made usable, when the reading unit

fails to read any of the pieces of management information, and

the program information generating unit generates, for

each piece of management information read by the reading unit,

individual program information for presenting a corresponding

20   content part as an individual program, when the reconstruction

judging unit judges that the content parts are to be individually

made usable.

4. The storage media management apparatus of Claim 2,

25   wherein

the reconstruction judging unit judges that the content

parts are to be individually made usable, when the reading

unit fails to read any of the pieces of management information,

and

5   the program information generating unit does not generate

the   reconstruction   program   information,   when   the

reconstruction judging unit judges that the content parts are

to be individually made usable.

10   5. The storage media management apparatus of Claim 2,

wherein

each piece of management information includes alteration

information indicating whether a corresponding content part

has been altered in a disconnected-state where a storage medium

15   storing the corresponding content part is being disconnected,

the reconstruction judging unit judges that the content

parts are to be individually made usable, when alteration

information included in any of the pieces of management

information read by the reading unit indicates that a

20   corresponding   content   part   has   been   altered   in   the

disconnected-state, and

the program information generating unit generates, for

each piece of management information read by the reading unit,

individual program information for presenting a corresponding

25   content part as an individual program, when the reconstruction

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judging unit judges that the content parts are to be individually made usable.

6. The storage media management apparatus of Claim 5, wherein

the alteration information includes (a) initial-state information that is a part of the reconstruction information and indicates an initial state of a corresponding content part and (b) current-state information that is a part of the individual information and indicates a current state of the corresponding content part, and

the initial-state information matching the current-state information indicates that the corresponding content part has not been altered in a disconnected-state where a storage medium storing the corresponding content part is being disconnected, and the initial-state information not matching the current-state information indicates that the corresponding content part has been altered in the disconnected-state.

7. The storage media management apparatus of Claim 2, wherein

each piece of management information includes alteration information indicating whether a corresponding content part has been altered in a disconnected-state where a storage medium storing the corresponding content part is being disconnected,

the reconstruction judging unit judges that the content parts are to be individually made usable, when alteration information included in any of the pieces of management information read by the reading unit indicates that a

5   corresponding content part has been altered in the disconnected-state, and

the program information generating unit does not generate the reconstruction program information, when the reconstruction judging unit judges that the content parts are

10   to be individually made usable.

8. The storage media management apparatus of Claim 7, wherein

the alteration information includes (a) initial-state

15   information that is a part of the reconstruction information and indicates an initial state of a corresponding content part and (b) current-state information that is a part of the individual information and indicates a current state of the corresponding content part, and

20   the initial-state information matching the current-state information indicates that the corresponding content part has not been altered in a disconnected-state where a storage medium storing the corresponding content part is being disconnected, and the initial-state information not matching the

25   current-state information indicates that the corresponding

content part has been altered in the disconnected-state.

9. The storage media management apparatus of Claim 2,
further comprising

5   a presenting unit operable to present the content as being
usable, when the program information generating unit generates
the reconstruction program information for presenting the
content.

10   10. The storage media management apparatus of Claim 9,
further comprising

a medium configuration presenting unit operable to
present information indicating which one of the storage media
stores each content part.

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11. The storage media management apparatus of Claim 9,
further comprising

a warning unit operable to, when a storage medium storing
one of the content parts is to be disconnected, warn that the
20   content is made unusable after the disconnection.

12. The storage media management apparatus of Claim 9,
wherein

each piece of management information includes total
25   number information indicating a total number of the content

parts, and

the storage media management apparatus further comprises

a usable proportion presenting unit operable to present

a proportion of (a) content parts stored in storage media that

5   have been connected and (b) content parts not stored in the

storage media that have been connected, among all the content

parts a number of which is equal to the total number indicated

by the total number information.

10   13. The storage media management apparatus of Claim 1,

wherein

the individual information includes at least an

identifier for uniquely identifying a corresponding content

part, and position information indicating a position at which

15   the corresponding content part is stored in a storage medium,

and

the reconstruction information includes at least an

identifier for uniquely identifying the content, total number

information indicating a total number of the content parts,

20   and sequence number information indicating a sequence number

given to a corresponding content part among sequence numbers

given sequentially to all the content parts.

14. The storage media management apparatus of Claim 1,

25   wherein

the dividing unit does not divide the content when a data

amount of the content is smaller than a capacity of an unused

storage area of one of the storage media, and divides the content

into the plurality of content parts when the data amount of

5   the content is larger than a capacity of an unused storage area

of each of the storage media, and

the writing unit writes each content part to a different

one of the storage media, when the dividing unit divides the

content, and writes the content to a storage media that has

10   an unused storage area whose capacity is larger than the data

amount of the content, when the dividing unit does not divide

the content.

15. The storage media management apparatus of Claim 14,

15   wherein

the writing unit includes a selecting unit operable to

select a storage medium whose unused storage area has the largest

capacity among the plurality of storage media, and

the writing unit writes one of the content parts to the

20   storage medium selected by the selecting unit when the dividing

unit divides the content, and writes the content to the storage

medium selected by the selecting unit when the dividing unit

does not divide the content.

25   16. The storage media management apparatus of Claim 1,

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wherein

each piece of management information includes presetting-condition information indicating a condition of presetting on which writing of a corresponding content part is based,

the writing unit includes

a same-condition detecting unit operable to detect, when the content is written based on presetting, a same-type content whose presetting-condition information indicates a same condition of presetting as indicated by presetting-condition information corresponding to the content, and

the writing unit writes one of the content parts to a storage medium storing the same-type content detected by the same-condition detecting unit when the dividing unit divides the content, and writes the content to the storage medium storing the same-type content detected by the same-type detecting unit when the dividing unit does not divide the content.

17. The storage media management apparatus of Claim 1, further comprising:

an available area judging unit operable to judge whether both of a first storage medium and a second storage medium have unused storage areas; and

an available area adjusting unit operable to, when both of the first storage medium and the second storage medium have

unused storage areas and both of the first storage medium and

the second storage medium respectively store two of the content

parts, move one content part stored in one of the first storage

medium and the second storage medium to another one of the first

5   storage medium and the second storage medium.

18. A storage media management method for use in a storage

media management apparatus to and from which a plurality of

storage media are connected and disconnected, the method

10   comprising:

a dividing step of dividing a content into a plurality

of content parts, for storing the content as being divided into

a plurality of storage media;

a management information generating step of generating

15   a plurality of pieces of management information in

correspondence to the content parts, each piece of management

information including (a) reconstruction information for

reconstructing the content by concatenating a corresponding

content part with the other content parts, and (b) individual

20   information for making the corresponding content part

individually usable;

a writing step of writing each content part together with

a corresponding piece of management information, to a different

one of storage media; and

25   a reconstruction judging step of judging, when a content

part stored in one of the storage media is to be used, whether

the content is to be reconstructed and made usable, or the content

parts are to be individually made usable, based on the piece

of management information stored in each storage medium.

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    19. The storage media management method of Claim 18,

further comprising:

    a reading step of reading the pieces of management

information from storage media that have been connected to the

10   storage media management apparatus; and

    a program information generating step of generating,

based on reconstruction information included in each piece of

management information read in the reading step, reconstruction

program information for presenting the content as one program,

15   when a judgment result in the reconstruction judging step shows

that the content is to be reconstructed and made usable.

    20. The storage media management method of Claim 19,

wherein

20   a judgment result in the reconstruction judging step shows

that the content parts are to be individually made usable, when

any of the pieces of management information is failed to be

read in the reading step, and

    in the program information generating step, individual

25   program information for presenting a corresponding content part

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as an individual program is generated for each piece of

management information read in the reading step, when a judgment

result in the reconstruction judging step shows that the content

parts are to be individually made usable.

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21. The storage media management method of Claim 19,

wherein

a judgment result in the reconstruction judging step shows

that the content parts are to be individually made usable, when

10   any of the pieces of management information is failed to be

read in the reading step, and

in the program information generating step, the

reconstruction program information is not generated, when a

judgment result in the reconstruction judging step shows that

15   the content parts are to be individually made usable.

22. The storage media management method of Claim 19,

wherein

each piece of management information includes alteration

20   information indicating whether a corresponding content part

has been altered in a disconnected-state where a storage medium

storing the corresponding content part is being disconnected

from the storage media management apparatus,

a judgment result in the reconstruction judging step shows

25   that the content parts are to be individually made usable, when

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alteration information included in any of the pieces of

management information read in the reading step indicates that

a corresponding content part has been altered in the

disconnected-state, and

5   in the program information generating step, individual

program information for presenting a corresponding content part

as an individual program is generated for each piece of

management information read in the reading step, when a judgment

result in the reconstruction judging step shows that the content

10   parts are to be individually made usable.   .

23. The storage media management method of Claim 22,

wherein

the alteration information includes (a) initial-state

15   information that is a part of the reconstruction information

and indicates an initial state of a corresponding content part

and (b) current-state information that is a part of the

individual information and indicates a current state of the

corresponding content part, and

20   the initial-state information matching the current-state

information indicates that the corresponding content part has

not been altered in a disconnected-state where a storage medium

storing the corresponding content part is being disconnected

from the storage media management apparatus, and the

25   initial-state information not matching the current-state

information indicates that the corresponding content part has been altered in the disconnected-state.

24. The storage media management method of Claim 19,
5   wherein

each piece of management information includes alteration information indicating whether a corresponding content part has been altered in a disconnected-state where a storage medium storing the corresponding content part is being disconnected
10   from the storage media management apparatus,

a judgment result in the reconstruction judging step shows that the content parts are to be individually made usable, when alteration information included in any of the pieces of management information read in the reading step indicates that
15   a corresponding content part has been altered in the disconnected-state, and

in the program information generating step, the reconstruction program information is not generated when a judgment result in the reconstruction judging step shows that
20   the content parts are to be individually made usable.

25. The storage media management method of Claim 24, wherein

the alteration information includes (a) initial-state
25   information that is a part of the reconstruction information

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and indicates an initial state of a corresponding content part and (b) current-state information that is a part of the reconstruction information and indicates a current state of the corresponding content part, and

5   the initial-state information matching the current-state information indicates that the corresponding content part has not been altered in a disconnected-state where a storage medium storing the corresponding content part is being disconnected from the storage media management apparatus, and the

10   initial-state information not matching the current-state information indicates that the corresponding content part has been altered in the disconnected-state.

26. The storage media management method of Claim 19,

15   further comprising

a presenting step of presenting, to a user of the storage media management apparatus, the content as being usable, when the reconstruction program information for presenting the content is generated in the program information generating step.

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27. The storage media management method of Claim 26, further comprising

a medium configuration presenting step of presenting, to the user, information indicating which one of the storage

25   media stores each content part.

28. The storage media management method of Claim 26, further comprising

a warning step of warning the user, when a storage medium

5   storing one of the content parts is to be disconnected, that the content is made unusable after the disconnection.

29. The storage media management method of Claim 26, wherein

10   each piece of management information includes total number information indicating a total number of the content parts, and

the storage media management method further comprises

a usable proportion presenting step of presenting, to

15   the user, a proportion of (a) content parts stored in storage media that have been connected to the storage media management apparatus and (b) content parts not stored in the storage media that have been connected to the storage media management apparatus, among all the content parts a number of which is

20   equal to the total number indicated by the total number information.

30. The storage media management method of Claim 18, wherein

25   the individual information includes at least an

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identifier for uniquely identifying a corresponding content

part, and position information indicating a position at which

the corresponding content part is stored in a storage medium,

and

5   the reconstruction information includes at least an

identifier for uniquely identifying the content, total number

information indicating a total number of the content parts,

and sequence number information indicating a sequence number

given to a corresponding content part among sequence numbers

10   given sequentially to all the content parts.

         31. The storage media management method of Claim 18,

wherein

         in the dividing step, the content is not divided when

15   a data amount of the content is smaller than a capacity of an

unused storage area of one of the storage media, and the content

is divided into the plurality of content parts when the data

amount of the content is larger than a capacity of an unused

storage area of each of the storage media, and

20   in the writing step, each content part is written to a

different one of the storage media, when the content is divided

in the dividing step, and the content is written to a storage

media that has an unused storage area whose capacity is larger

than the data amount of the content, when the content is not

25   divided in the dividing step.

32. The storage media management method of Claim 31, wherein

the writing step includes:

5   a selecting substep of selecting a storage medium whose unused storage area has the largest capacity among the plurality of storage media; and

a largest unused area writing substep of writing one of the content parts to the storage medium selected in the selecting

10   substep when the content is divided in the dividing step, and writing the content to the storage medium selected in the selecting substep when the content is not divided in the dividing step.

15   33. The storage media management method of Claim 18, wherein

each piece of management information includes presetting-condition information indicating a condition of presetting on which writing of a corresponding content part

20   is based, and

the writing unit includes:

a same-condition detecting substep of detecting, when the content is written based on presetting, a same-type content whose presetting-condition information indicates a same

25   condition of presetting as indicated by presetting-condition

information corresponding to the content; and

a same-condition writing substep of writing one of the content parts to a storage medium storing the same-type content detected in the same-condition detecting substep when the

5   content is divided in the dividing step, and writing the content to the storage medium storing the same-type content detected in the same-type detecting substep when the content is not divided in the dividing step.

10   34. The storage media management method of Claim 18, further comprising:

an available area judging step of judging whether both of a first storage medium and a second storage medium have unused storage areas; and

15   an available area adjusting step of, when both of the first storage medium and the second storage medium have unused storage areas and both of the first storage medium and the second storage medium respectively store two of the content parts, moving one content part stored in one of the first storage medium

20   and the second storage medium to another one of the first storage medium and the second storage medium.

35. A storage media management program that enables a computer to and from which a plurality of storage media are

25   connected and disconnected, to execute the steps of:

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dividing a content into a plurality of content parts;

generating a plurality of pieces of management information in correspondence to the content parts, each piece of management information including (a) reconstruction

5 information for reconstructing the content by concatenating a corresponding content part with the other content parts, and (b) individual information for making the corresponding content part individually usable;

writing each content part together with a corresponding

10 piece of management information, to a different one of storage media; and

judging, when a content part stored in one of the storage media is to be used, whether the content is to be reconstructed and made usable, or the content parts are to be individually

15 made usable, based on the piece of management information stored in each storage medium.

36. A system LSI that controls a storage media management apparatus, wherein

20 the system LSI executes the storage media management program of Claim 35.